

## **New Mexico Environmental and Health Effects Tracking Program Arsenic in Drinking Water Project**

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The purpose of the New Mexico Environmental and Health Effects Tracking Program is to demonstrate and evaluate methods for linking data from ongoing and existing health effects surveillance systems with environmental data in order to increase the understanding of the relationship between health and environmental exposures through enhanced surveillance and standardized data system integration.

### **Arsenic in Drinking Water Project**

The objective of the project is to demonstrate and evaluate methods for establishing a statewide environmental health surveillance system to monitor health effects, cancer incidence rates in this case, according to arsenic drinking water levels. Geographic Information System (GIS) technologies will play a large part in spatially linking environmental data with health effects. Specific project aims of interest include:

Enhance the drinking water monitoring data to permit linkage and statewide analyses of arsenic in drinking water and health effects at the census tract level.

Implement a geographic record linkage project that links statewide cancer surveillance data with environmental exposure data on arsenic in drinking water.

Explore the utility of GIS technology to facilitate and promote data linkage, analysis, and data dissemination activities.

Demonstrate the utility of the linked data for surveillance purposes by examining cancer incidence rates according to drinking water arsenic levels.

Conduct an assessment of prospective expansion of the data linkage capacity to additional drinking water contaminants (e.g., disinfection by-products).

### **Background and Significance**

Arsenic is an established human carcinogen that occurs naturally in drinking water. International studies have shown that chronic consumption of water containing arsenic in excess of 300 parts per billion (ppb) has been associated with increased risks of non-melanoma skin cancer (NMSC) and various internal cancers, including lung, bladder, kidney, liver, and colon. In 2001, the U.S. EPA lowered the maximal contaminant level (MCL) standard for arsenic in drinking water from 50 ppb to 10 ppb based on low-dose extrapolation of the international data and risk assessment modeling indicating excess cancer risks below the 50 ppb level. Although the majority of water systems in the U.S. contain less than 10 ppb of arsenic, there are regional “hot spots” where drinking water arsenic concentrations frequently range from 10-50 ppb.

In New Mexico, arsenic-rich ground strata is common in many parts of the state and ground water arsenic in these areas routinely is found in the range of 10-50 ppb. Over 80% of the state population is served by public water supply, the vast majority of which (90%) utilize ground water. In the Albuquerque metropolitan area, home to about a third of the state population, drinking water arsenic levels historically have averaged 10-30 ppb, with maximal detected levels over 50 ppb. In other smaller communities, such as San Ysidro, drinking water arsenic levels have been measured as high as 200 ppb. Given the uncertainty of the magnitude of cancer risk associated with chronic low-level arsenic ingestion, it would be prudent public health practice to examine and monitor cancer rates among U.S. populations exposed to high levels of arsenic in their drinking water. New Mexico is an ideal location for such a project since the groundwater arsenic concentrations (i.e., exposure concentrations) have been both elevated and steady over time and the population at risk also have been relatively stable.

#### Speaker Biography:

Len Flowers is the Bureau Chief for the Environmental Health Epidemiology Bureau for the New Mexico Department of Health. She is a toxicologist with 20 years of experience conducting environmental health assessments at sites in New Mexico, throughout the US, Canada and Europe. She is the principle investigator on several CDC grants addressing arsenic exposure and toxicity including linking drinking water data with tumor registry data and biomonitoring of arsenic exposures

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